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INFLAMMATION IN ARTERIAL VESSELS AND DIFFERENT FAT TISSUES AS PROSPECTIVELY ASSESSED BY 18F-FDG-PET/CT ARE HIGHLY CORRELATED

Poster Contributions
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Background: There is increasing evidence that the link between obesity and cardiovascular disease might be driven by inflammation in both fat tissue and the arterial wall. 18F-fluorodeoxyglucose positron emission tomography (FDG-PET) uptake is a surrogate marker of vessel wall inflammation. The aim of this study was to measure and quantify inflammation by quantifying FDG uptake in the vasculature and in several fat tissue regions (FTRs).

Methods: 173 cardiovascular patients were prospectively imaged with FDG-PET/CT (age 56.8±11.5). FDG uptake in the carotids, ascending aorta, subcutaneous fat tissue in the neck- (NeckSub), presternal- (ChestSub), abdominal region (AbdomenSub) and the pericardial fat tissue (ChestPeri) were quantified as the mean of the maximal standardized uptake values (meanSUVmax) and the mean of the maximal target-to-background ratio (meanTBRmax). Multivariate regression analyses were performed to identify significant associations between FDG uptake in the arteries, different FTRs and clinical variables as given by the standardized correlation coefficient (β).

Results: FDG uptake in the FTRs was consistently predictive of the FDG uptake in the carotids (meanSUVmax: NeckSub: β:0.254, p=0.001; AbdomenSub: β:0.178, p=0.011; meanTBRmax: NeckSub: β:0.248, p=0.001) and aorta (meanSUVmax: ChestPeri: β:0.249, p=0.001; ChestSub: β:0.213, p=0.004; NeckSub: β:0.152, p=0.034; meanTBRmax: ChestPeri: β:0.236, p=0.003; AbdomenSub: β:0.207, p=0.007). Obesity was significantly associated with increased FDG uptake in the FTRs (meanSUVmax: NeckSub: β:0.371, p<0.0001; AbdomenSub: β:0.360, p=0.004; ChestSub: β:0.228, p=0.002; ChestPeri: β:0.185, p=0.021; meanTBRmax: NeckSub: β:0.470, p<0.0001; AbdomenSub: β:0.339, p=0.006; ChestSub: β:0.619, p=0.028; ChestPeri: β:0.978, p=0.035).

Conclusions: FDG uptake in the different FTRs was significantly associated with the vascular FDG uptake and increasing body weight consistently predicted fat tissue FDG uptake. FDG-PET may therefore provide imaging evidence for the well-known inflammatory link between fat tissue and the vasculature as seen in cardiovascular disease.